

INTELLIGENT URL REDIRECTOR

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BACKGROUND OF THE INVENTION

1. Technical Field:

The present invention relates generally to computer software and, more particularly, to electronic mail and
10 embedded universal resource locator links.

2. Description of Related Art:

E-mail has become ubiquitous in today's world and, as such, and because of its convenience to the consumer
15 as well as the business, many businesses have come to utilize e-mail as part of their marketing process. Because many e-mail programs support formatted information rather than just text, many businesses have utilized the multimedia features supported by e-mail
20 programs to dress up their e-mail advertisements. For example, it is common now for e-mail advertisements to be formatted in, for example, Hypertext Markup Language (HTML), and contain pictures, other graphics, and/or animation with Universal Resource Locator (URL) (i.e.,
25 links to web pages) imbedded in the images or as separate text. This allows the e-mail recipient to conveniently navigate to the web site of the business containing more information about the product advertised and/or a web page for purchasing the advertised item.

Typically, these e-mails are built using templates placing images in locations in the template, such as, for example, the logo of the business, top navigation, and an image of the product advertised. Each of these images
5 may contain a link to a destination at a business web site. For example, an advertisement for an automobile may contain an image of the advertised automobile, which contains a link to a web page providing more information about the advertised automobile, as well as a logo for
10 the automobile manufacturer with the logo providing a link to the manufacturer's general web site. In any case, the URL is hard-coded into the e-mail sent to the consumer.

However, consumers often times do not immediately
15 click on the link in the e-mail when they receive the e-mail, but instead wait until a more convenient time to peruse the contents of the e-mail. However, often times it becomes necessary, for a variety of reasons, after the e-mail is sent, to change the location of the web page to
20 which the URL embedded in the e-mail referred. Thus, for consumers who wait too long to click on the link or for consumers who wish to come back to the web page at a later time, the destination URL embedded in the image is no longer be available. This is frustrating for the
25 consumer and may lead to a lost sale or, at the very least, some ill will toward the business.

Therefore, it would be desirable to have a method, system, and computer program product that allows a business to send an e-mail with an embedded link that

allows the business to change the location of the web page while still allowing the consumer to access to the web page through the embedded link in the e-mail message.

SUMMARY OF THE INVENTION

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The present invention provides method, system, and computer program product for directing a recipient of an e-mail to a web site. In one embodiment, an e-mail with an embedded link is created, wherein the embedded link
10 comprises a link to a redirect server and link attributes that allow the redirect server to determine a current web site associated with the embedded link. The e-mail with the embedded link is then sent to a recipient. The e-mail is received by the recipient and, responsive to the
15 recipient selecting the embedded link within the e-mail, link attributes are sent from the recipient's data processing system to the redirect server. The link attributes are received at the redirect server and the redirect server determines the universal resource locator
20 for the current web site associated with the embedded link. The universal resource locator is then sent from the redirect server to the recipient, which then utilizes the universal resource locator to retrieve the contents from the current web site.

BRIEF DESCRIPTION OF THE DRAWINGS

5 The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, however, as well as a preferred mode of use, further objectives and advantages thereof, will best be understood by reference to the following detailed
10 description of an illustrative embodiment when read in conjunction with the accompanying drawings, wherein:

Figure 1 depicts a pictorial representation of a distributed data processing system in which the present invention may be implemented;

15 **Figure 2** depicts a block diagram of a data processing system which may be implemented as a server is depicted in accordance with the present invention;

Figure 3 depicts a block diagram of a data processing system in which the present invention may be
20 implemented;

Figure 4 depicts a pictorial diagram illustrating a system of sending electronic mail (e-mail) with embedded links to web sites and system for providing the web sites to a user in accordance with one embodiment of the
25 present invention;

Figure 5 depicts a diagram illustrating an exemplary process flow and program function for creating and sending an e-mail with embedded links in accordance with one embodiment of the present invention;

Figure 6 depicts a diagram illustrating an exemplary process flow and program function for receiving an e-mail with an embedded link and retrieving web site associated with the content of the e-mail in accordance with one
5 embodiment of the present invention; and

Figure 7 depicts a diagram illustrating an exemplary process flow and program function for redirecting a user to an appropriate web site in accordance with one embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

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With reference now to the figures, and in particular with reference to **Figure 1**, a pictorial representation of a distributed data processing system is depicted in which the present invention may be implemented.

10 Distributed data processing system **100** is a network of computers in which the present invention may be implemented. Distributed data processing system **100** contains network **102**, which is the medium used to provide communications links between various devices and
15 computers connected within distributed data processing system **100**. Network **102** may include permanent connections, such as wire or fiber optic cables, or temporary connections made through telephone connections.

In the depicted example, e-mail server **104**,
20 redirector server **105**, and web server **106** are connected to network **102**. In addition, clients **108**, **110** and **112** are also connected to network **102**. These clients, **108**, **110** and **112**, may be, for example, personal computers or network computers. For purposes of this application, a
25 network computer is any computer coupled to a network that receives a program or other application from another computer coupled to the network. Distributed data processing system **100** may include additional servers, clients, and other devices not shown.

In the depicted example, e-mail server **104** e-mail messages to clients **108-112**. Some of the e-mail messages may include text, graphics, and Universal Resource Locators (URLs), commonly referred to as "links",
5 embedded in the text and/or graphics. The links contain a link to a redirect server **105** and a set of parameters that identify the content the sender of the e-mail desires for the e-mail recipient to access. When a user "clicks" or otherwise selects the embedded link, the
10 user's client, such as any one of client's **108-112** accesses the redirect server **105** and provides the redirect server **105** with the set of parameters that were embedded in the link. The redirect server determines the location of correct and current the web site that the e-
15 mail sender desires the e-mail recipient to access and sends the address of this web site back to the client **108-112**. The client **108-112** then accesses the web site on, for example, web server **106** and retrieves the content from the web site to provide to the user.

20 The embedded link in the e-mail message does not contain a hard coded link to the web site since it is possible that the content that the e-mail sender desires the recipient may change or be relocated to a different web site. Thus, by sending a link to the redirect server
25 rather than to a web site, the e-mail sender may change the content and location of the web site at will and merely update a database on the redirect server **105** and still have the e-mail recipient directed to the correct web site even if the recipient does not "click" on the

embedded link for some time after the e-mail sender sent the e-mail to the recipient.

In the depicted example, distributed data processing system **100** is the Internet, with network **102** representing
5 a worldwide collection of networks and gateways that use the TCP/IP suite of protocols to communicate with one another. At the heart of the Internet is a backbone of high-speed data communication lines between major nodes or host computers consisting of thousands of commercial,
10 government, education, and other computer systems that route data and messages. Of course, distributed data processing system **100** also may be implemented as a number of different types of networks such as, for example, an intranet or a local area network.

15 **Figure 1** is intended as an example and not as an architectural limitation for the processes of the present invention.

Referring to **Figure 2**, a block diagram of a data processing system which may be implemented as a server,
20 such as any one of servers **104-106** in **Figure 1**, is depicted in accordance with the present invention. Data processing system **200** may be a symmetric multiprocessor (SMP) system including a plurality of processors **202** and **204** connected to system bus **206**. Alternatively, a single
25 processor system may be employed. Also connected to system bus **206** is memory controller/cache **208**, which provides an interface to local memory **209**. I/O bus bridge **210** is connected to system bus **206** and provides an

interface to I/O bus **212**. Memory controller/cache **208** and I/O bus bridge **210** may be integrated as depicted.

Peripheral component interconnect (PCI) bus bridge **214** connected to I/O bus **212** provides an interface to PCI local bus **216**. A number of modems **218-220** may be connected to PCI bus **216**. Typical PCI bus implementations will support four PCI expansion slots or add-in connectors. Communications links to network computers **108-112** in **Figure 1** may be provided through modem **218** and network adapter **220** connected to PCI local bus **216** through add-in boards.

Additional PCI bus bridges **222** and **224** provide interfaces for additional PCI buses **226** and **228**, from which additional modems or network adapters may be supported. In this manner, server **200** allows connections to multiple network computers. A memory mapped graphics adapter **230** and hard disk **232** may also be connected to I/O bus **212** as depicted, either directly or indirectly.

Those of ordinary skill in the art will appreciate that the hardware depicted in **Figure 2** may vary. For example, other peripheral devices, such as optical disk drives and the like, also may be used in addition to or in place of the hardware depicted. The depicted example is not meant to imply architectural limitations with respect to the present invention.

Data processing system **200** may be implemented as, for example, an AlphaServer GS1280 running a UNIX® operating system. AlphaServer GS1280 is a product of Hewlett-Packard Company of Palo Alto, California.

"AlphaServer" is a trademark of Hewlett-Packard Company.
"UNIX" is a registered trademark of The Open Group in the
United States and other countries

With reference now to **Figure 3**, a block diagram of a
5 data processing system in which the present invention may
be implemented is illustrated. Data processing system
300 is an example of a client computer. Data processing
system **300** employs a peripheral component interconnect
(PCI) local bus architecture. Although the depicted
10 example employs a PCI bus, other bus architectures, such
as Micro Channel and ISA, may be used. Processor **302** and
main memory **304** are connected to PCI local bus **306**
through PCI bridge **308**. PCI bridge **308** may also include
an integrated memory controller and cache memory for
15 processor **302**. Additional connections to PCI local bus
306 may be made through direct component interconnection
or through add-in boards. In the depicted example, local
area network (LAN) adapter **310**, SCSI host bus adapter
312, and expansion bus interface **314** are connected to PCI
20 local bus **306** by direct component connection. In
contrast, audio adapter **316**, graphics adapter **318**, and
audio/video adapter (A/V) **319** are connected to PCI local
bus **306** by add-in boards inserted into expansion slots.
Expansion bus interface **314** provides a connection for a
25 keyboard and mouse adapter **320**, modem **322**, and additional
memory **324**. In the depicted example, SCSI host bus
adapter **312** provides a connection for hard disk drive
326, tape drive **328**, CD-ROM drive **330**, and digital video
disc read only memory drive (DVD-ROM) **332**. Typical PCI

local bus implementations will support three or four PCI expansion slots or add-in connectors.

An operating system runs on processor **302** and is used to coordinate and provide control of various

5 components within data processing system **300** in **Figure 3**.

The operating system may be a commercially available operating system, such as Windows XP, which is available from Microsoft Corporation of Redmond, Washington.

"Windows XP" is a trademark of Microsoft Corporation. An
10 object oriented programming system, such as Java, may run in conjunction with the operating system, providing calls to the operating system from Java programs or applications executing on data processing system **300**.

Instructions for the operating system, the object-
15 oriented operating system, and applications or programs are located on a storage device, such as hard disk drive **326**, and may be loaded into main memory **304** for execution by processor **302**.

Those of ordinary skill in the art will appreciate
20 that the hardware in **Figure 3** may vary depending on the implementation. For example, other peripheral devices, such as optical disk drives and the like, may be used in addition to or in place of the hardware depicted in **Figure 3**. The depicted example is not meant to imply
25 architectural limitations with respect to the present invention. For example, the processes of the present invention may be applied to multiprocessor data processing systems.

With reference now to **Figure 4**, a pictorial diagram illustrating a system of sending electronic mail (e-mail) with embedded links to web sites and system for providing the web sites to a user is depicted in accordance with one embodiment of the present invention. One embodiment of a redirect server system depicted in **Figure 4** comprises a redirect server **404**, an image based template **418**, an outbound mail server **420**, a consumer data processing system **402**, and client web sites **422**. The redirect server **404** includes an attribute-link properties file **408**, a redirect application **410**, and redirect activity log files **406**. Redirect server **404** and Outbound mail server **420** may be implemented as, for example, server **200** depicted in **Figure 2**. Consumer **402** may be implemented as, for example, data processing system **300** depicted in **Figure 3**.

E-mails, such as, for example, marketing e-mails, are sent to consumers **402** from outbound mail server **420**. The e-mails are typically built using a template by placing images, such as, for example, the logo, top navigation, product image placeholder, etc., in location in the template. Some images or text in these e-mails contain links to web sites that the sender of the e-mail would like the consumer **402** to visit. However, rather than hard-code the destination universal resource locator (URL) into the e-mail sent to consumers **402** as in the prior art, the redirect system of the present invention separates the actual destination (URL) from the e-mail link and replaces it with a link to redirect server **404**

which maintains an attribute-link properties file **408** allowing redirect application **410** to determine the current location of the client web site(s) **422** that the sender of the e-mail desires the consumer **402** to visit.

- 5 The redirect application **410** will then forward to the consumer **402** the URL of the web site **422** that e-mail sender desires the consumer **402** to visit.

Thus, a group, such as, for example, an eMarketing mail support group, works with various agencies within an
10 organization in charge of different web sites to coordinate link destinations desired for each e-mail and maintains these link properties in an attribute-link properties file **408**. Links are inserted into various locations in image based template **418** as desired where
15 the links direct a consumer **402** to various web sites **422** depending upon which link is selected by the consumer **402**. However, the links do not contain a URL for the desired client web sites **422** but contain a URL directing the consumer **402** to the redirect server **404** and link
20 attributes that are readable by redirect application **410**. The link attributes allow redirect application **410** to consult attribute-link properties file **408** to determine a current location for the desired web site **422** based on the link attributes.

- 25 Once the image based template **418** has been encoded with the link attributes and URL to the redirect sever **404** and with any other information desired to be sent to the consumer **402**, the e-mail with link attributes is sent

to outbound mail server **420** which then sends the e-mail to each consumer **402** specified by the organization.

Once the consumer **402** receives the e-mail, the consumer **402** may select one of the links within the e-mail in order to retrieve more information about a subject from the client web site **422**. However, by selecting the link, the consumer **402** is not immediately directed to client web sites **422**, but rather is directed to redirect server **404**. The consumer **402** sends the redirect server link attributes associated with the link selected by consumer **402**. A redirect application **410** within redirect server **404** consults attribute-link properties file **408** to determine the current location of the web site **422** associated with the link selected by the consumer **402**. Redirect application **410** then returns a redirect link with the current URL for the desired web site **422** to consumer **402** which then uses the current URL to access client web site **422**.

The eMarketing mail support group maintains the attribute-link properties file **408** updating the file so that the current location of client web sites **422** are associated with the appropriate link properties within attribute-link properties file **408**. Thus, if for some reason it becomes desirable or necessary to change the URL location for the web site **422** associated with the links sent to a user in an e-mail, the user may nevertheless be able to navigate to the appropriate web site **422** since the e-mail that the consumer **402** received contains not a URL for the web site, but a URL for the

redirect server **404** with link properties allowing the redirect server to determine and send the consumer **402** the correct current URL for the web site associated with the selection made by the consumer **402**.

5 The redirect application **410** also records redirect activity to log files **406** which may be read by a retrieve log files function **412** and sent to a reporting function to allow various persons to monitor the activity and function of the redirect system.

10 In some embodiments, the link associations (i.e., the associations between the current URLs and the link attributes) may be kept in a spreadsheet, such as, for example, an Excel[®] spreadsheet. Excel[®] is a product and registered trademark of the Microsoft Corporation of
15 Redmond, Washington. In other embodiments, rather than utilizing a spreadsheet, the association of parameters or link attributes to link destinations could be maintained in a database.

 In one embodiment, the redirect application **410** is
20 based on a Java servlet architecture built with open source Struts framework. The servlet processes incoming request, then processes the parameters on the request to format a key. This key is used to find a URL destination within the organization's family of web sites where the
25 agencies desire the e-mail recipient to go when the recipient clicks on an image in the e-mail. The key/url destination(value) pair are loaded into the servlet at startup time. The key/value pairs are in a '.properties' file. This file is built from a template used by, for

example, an advertising agency, to manage what link should be associated with an image in the e-mail.

Some benefits of the present invention are that additional e-mail campaigns using embedded links in rich content e-mails can be implemented with minimal effort. New link and segment additions do not require rework of existing e-mail content. Addition of a new segment will change the Links Application instead of change to all e-mail versions, saving effort and cost. The present invention also provides immediate change to all versions of outbound mailers. When a link is changed all future and previously sent e-mails are effectively updated. This means all users are being directed to the most current content. The present invention provides extremely quick turnaround on delivering new high priority incentives, changes, content, etc. to market. The present invention can be used in other outbound campaigns as well as a redirect management tool for static web pages. Parameterized default destination URLs have been added by the present invention to the processing to help avoid users receiving 'page no found (404)' errors.

If the present invention is provided by a IT firm to clients to aid clients in reaching target consumers, the solution can also be extended such that the IT firm can provide the service to multiple clients and not just a single client. The activity logs could be incorporated into a reporting and analysis process to help understand user activity with information such as which links were

chosen the most, what is a typical latency time from the e-mail being sent to being acted on with a link, the relationship of: how the consumers' information requests to getting the e-mail to clicking on the e-mail to taking
5 action at the client site.

With reference now to **Figure 5**, a diagram illustrating an exemplary process flow and program function for creating and sending an e-mail with embedded links is depicted in accordance with one embodiment of the
10 present invention. To begin, an e-mail template with locations for embedded links is created (step **502**). Link attributes (such as, for example, the content or type of content to be linked to, the product or service name advertised in the e-mail, graphic name, etc.) for the
15 embedded links are determined (step **504**). The link attributes along with a universal resource locator (URL) directing an e-mail recipient's web browser to the redirect server are embedded in the e-mail and the link attributes and location of a web page associated with the
20 link attributes are stored to be accessed by the redirect server (step **506**). The e-mail, with embedded links and associated link attributes are sent to e-mail recipients (step **508**).

Referring now to **Figure 6**, a diagram illustrating an
25 exemplary process flow and program function for receiving an e-mail with an embedded link and retrieving web site associated with the content of the e-mail is depicted in accordance with one embodiment of the present invention. A recipient receives an e-mail with embedded links (step

602). The recipient may chose to open the e-mail and desire more information about an item descried in the e-mail. The recipient, therefore, selects (such as, for example, by situating a cursor inside an area of the video display device and then "clicking" a mouse button on the user's mouse) the link, embedded in the e-mail associated with the item for which the user desires more information. The user's e-mail software receives the user's selection of the embedded link (step 604), opens a web browser (step 606), and instructs the web browser to contact the redirect server and send link attributes associated with the particular embedded link selected by the user (step 608).

The redirect server receives the link attributes, determines the URL of the web site to direct the recipient to, and sends the URL back to the recipient. The recipient's web browser receives the URL for the web site from the redirect server (step 610) and contacts the web site using the newly acquired URL (step 612). The web browser then receives the content from the web site and displays it to the e-mail recipient (step 614).

Although described in the context of an e-mail program and separate web browser, such a configuration is not required. For example, in some embodiments, the e-mail function and web browsing function may be incorporated into a single software product. Thus, the particular implementation chosen to receive e-mail and retrieve web pages should not inferred as a limitation of the present invention.

With reference now to **Figure 7**, a diagram illustrating an exemplary process flow and program function for redirecting a user to an appropriate web site is depicted in accordance with one embodiment of the present invention. To begin, the redirect server receives link attributes from a client (step **702**). The redirect server consults a link attribute properties file or database to determine the URL for the web site corresponding to the link attributes received from the client (step **704**). Once the redirect server has determined the appropriate URL, the redirect server sends the URL for the web site associated with the link attributes to the client (step **706**) which may then use it to access the web site.

Although the present invention has been described primarily in terms of image based template e-mails used for marketing purposes, those skilled in the art will recognize that the invention is not limited to such purposes nor to such e-mail formats, but may be extended to any type of e-mail containing links and used for any purpose for which e-mails are utilized.

It is important to note that while the present invention has been described in the context of a fully functioning data processing system, those of ordinary skill in the art will appreciate that the processes of the present invention are capable of being distributed in the form of a computer readable medium of instructions and a variety of forms and that the present invention applies equally regardless of the particular type of

signal bearing media actually used to carry out the
distribution. Examples of computer readable media
include recordable-type media such a floppy disc, a hard
disk drive, a RAM, and CD-ROMs and transmission-type
5 media such as digital and analog communications links.

The description of the present invention has been
presented for purposes of illustration and description,
but is not intended to be exhaustive or limited to the
invention in the form disclosed. Many modifications and
10 variations will be apparent to those of ordinary skill in
the art. The embodiment was chosen and described in
order to best explain the principles of the invention,
the practical application, and to enable others of
ordinary skill in the art to understand the invention for
15 various embodiments with various modifications as are
suited to the particular use contemplated.